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A Note on Phenothiazine Poisoning with special reference to reports of its occurrence in Horses

E. L. TAYLOR

VETERINARY LABORATORY, MINISTRY OF AGRICULTURE

This note is written in order to warn practitioners to proceed with a certain amount of caution in the use of phenothiazine as an anthelmintic in horses. In the early trials this drug promised to be the long sought perfect anthelmintic: it was found to be easy to administer, effective and safe; furthermore, it was reasonably cheap, with promise of becoming very cheap when increased demand required its manufacture in large quantities. Extensive trials involving the anthelmintic treatment of hundreds of horses appeared to give ample confirmation of these results and the wide difference between the full anthelmintic dose and the toxic dose, somewhere in the region of 1 : 10, as observed in experimental horses, encouraged the belief in its perfect safety. Unfortunately, however, further employment of the drug among horses kept under more varied conditions and in different parts of the world has subsequently revealed the existence of the same curious occasional susceptibility to intoxication that was observed to be associated with the use of carbon tetrachloride.

It will be remembered that Montgomerie's extensive trials with carbon tetrachloride for the control of fascioliasis, carried out in North Wales, showed it to be at the same time both extremely toxic to the parasite and perfectly harmless to the host in amounts ranging up to 50 or 100 times the anthelmintic dose. This was something quite new in anthelmintic medication as the poisonous nature of all effective anthelmintics previously known had been only too obvious. The extremely important economic problem of the control of fascioliasis therefore appeared to have been solved, at least in so far as sheep were concerned; but some time later, after extensive trials on hundreds or thousands of sheep had proved successful, some cases of fatal poisoning came to notice—and this ultimately proved to be not a mere matter of occasional susceptible individuals, but of susceptible flocks, usually those associated with rich lowland pasture, and receiving a supplementary ration of concentrated food.

The occurrence of phenothiazine sensitivity is a most interesting repetition of anthelmintic history, and the fact that two of the most potent anthelmintic drugs known to us should have these strange characteristics in common may have a special significance. The influence of a nutritional factor is clearly indicated and as a working theory for further investigation one may suppose it to operate through some change in the permeability of cells in the host's tissues, having the effect of equalising that difference between the tissues of the parasitic worm and those of the host upon which difference anthelmintic medication depends.

On looking through the literature for observations on the toxicity of phenothiazine one finds an early reference to its harmlessness where Eddy, Cox and De Eds (1937) observed that rats could withstand a daily dosage up to 0·25 per cent. by weight of their diet for 295 days.

A later report by Newcomer (1937) described more or less severe burning, similar to sunburn, affecting the skin of labourers engaged in orchard spraying for the control of the codling moth—the first parasiticidal use to which this drug was put. Further observations by De Eds, Wilson and Thomas (1940) suggested this effect to be the result of a photosensitisation brought about through the presence in the body of the derivatives of phenothiazine, and not to be the result of mere irritation of the skin. Swales (1940) afterwards tried to produce the same effect in white-faced sheep by exposing them to brilliant sunshine after the administration of phenothiazine, but was unable to observe any effect.

De Eds, Stockton and Thomas (1939) reported intoxication in three out of nineteen human patients who had received a total of 22·4, 28·1 and 19·9 grammes respectively. A more or less well-marked anaemia was the principal evidence of the toxic action and the authors recommended that the dose should never exceed 15 grammes. Hubble (1941) reported similar observations in children, the jaundice and anaemia produced being suggestive of a toxic hepatitis.

The first report of intoxication from the administration of the ordinary anthelmintic dose to horses came from Errington and Westerfield (1940) who observed the erythrocyte count to be reduced to between 25 and 36 per cent. below the average counts made previous to dosing. Symptoms of intoxication, however, were not observed except in one case, a mare suffering from chronic diarrhoea; at the time of the administration of the dose this animal exhibited a certain amount of abdominal pain; the symptom soon passed off, however, and the authors concluded that this highly efficient anthelmintic could be used with safety in thoroughbreds in doses of 45 grammes.

Unfortunate results in thoroughbred horses were next reported by Hatcher (1941) who had been called in as a veterinary practitioner in connection with severe and fatal intoxication resulting from the administration of a special mixture, containing phenothiazine, which had been prepared for the owner. This mixture was as follows:—

Oats	...	...	90 lb.
Bran	...	...	80 ,,
Phenothiazine	...	...	25 ,,
Molasses	...	...	40 ,,

Each horse had been given 2½ lb. of the mixture and would therefore receive about 4 oz. of phenothiazine, *i.e.*, about four times the usual dose. On the day following the administration of the dose all appeared to be well, but two horses died on the second day, one on the third, one on the fourth and one on the eighth, each having exhibited severe abdominal pain for some time before death. Apparently only one animal, a horse aged 28 years, escaped without having shown any signs of intoxication. The visible mucous membranes of the affected animals were observed to be of a purple colour and the white of the eyes was dark yellow; the heart appeared to be a little fast and weak but there was no noticeable rise of temperature. Hatcher reported that the most noticeable change seen on *post-mortem* examination of the internal organs was the enlargement of the kidneys and spleen, the kidneys in one horse measuring 12 to 14 inches long and 7 to 8 inches wide, and the spleen being 40 inches long, 20 inches wide and 7 inches thick. The heart was also greatly enlarged, being described as "large enough to fit into a three gallon bucket." By way of treatment, trial was made of calcium gluconate, methylene blue, and of purgatives, but without any apparent benefit.

In a second report Errington (1941) described further observations of intoxication following the administration of doses ranging up to 90 grammes. Some of the observations suggested a difference between the toxicity of two samples of phenothiazine, but this could not be substantiated and after taking everything into consideration it was concluded that 30 grammes is a reasonably safe dose. He also reported the *post-mortem* observation of greatly enlarged kidneys, the weight of individual kidneys from the thoroughbred horses ranging up to 1970 grammes. Microscopical examination showed evidence of acute inflammation in this tissue, but Errington considered that the "degenerative changes were so severe as to suggest that a chronic condition had been present at the time of treatment"; so implying a doubt in his mind as to there being any connection between the condition of the kidneys and the dose of phenothiazine.

Fincher and Gibbons (1941) reported untoward results from the use of phenothiazine in doses ranging from 15 to 45 grammes, among a group of 23 light horses in very poor condition. The ages of the animals varied from two years to "very old" and their weights from 200 to 900 lb.: they were anaemic and emaciated, and had been in this condition for some time before they were dosed. Within from 24 to 36 hours after treatment eight of the 20 horses ceased to feed and showed various other symptoms—constipation, marked icterus, paleness of mucous membranes, rapid pulse and temperature of from 102·6° to 104° F. There

were also signs of slight colicky pains; some of the animals staggered about and sometimes fell down, and two of their number died.

Wolfe and Dennis (1941) published an account of a fatal intoxication resulting from the administration of 65 grammes to a six-year-old horse weighing 1,300 lb. Two days following the dose the mucous membranes were very cyanotic and icteric and evidence of irritation in the urinary system was shown by the frequent passage of urine. On the seventh day the temperature had risen to 104° F. and muscular weakness was so marked that the animal was unable to rise, and was destroyed. Of the several treatments tried intravenous injection of citrated blood was the only one which appeared to produce any beneficial effect; six quarts were given in all, a temporary benefit being noticeable after each injection.

Finally, Schmidt, Christian and Smotherman (1941) published an account of fatal intoxications in two groups of horses. In the first group, ten thoroughbred horses were treated with 30 to 60 grammes of the drug and two died, one on the fourth day and one on the ninth day. Greatly enlarged kidneys and spleen and enlarged heart were again observed on *post-mortem* examination. The second group was of thoroughbred horses that had been treated by a neighbouring veterinary practitioner: five of these horses had received phenothiazine in amounts ranging up to 100 grammes, and quickly showed signs of intoxication: two of their number died on the second day, two on the third and one ultimately made a recovery.

EXPERIENCES IN GREAT BRITAIN

First Example

The first report of what must now be regarded as a case of fatal poisoning from phenothiazine, came to our notice early in 1940 and concerned a yearling thoroughbred which was fasted for 36 hours before the administration of 60 grammes of phenothiazine powder. Twenty-four hours later a marked dullness was noted, accompanied by slightly increased respiration; the temperature was normal but there was some evidence of colicky pain, the appetite completely disappeared and death supervened on the fifth day. At *post-mortem* examination the liver proved to be very greatly enlarged and was estimated by the veterinary practitioner as being about three times the normal size; the heart was greatly enlarged and was considered to be twice its normal size; and the kidneys and spleen were also very greatly enlarged. Since apart from their large size these organs appeared, to the naked eye, to be healthy, the veterinary practitioner, who had previously used phenothiazine to a considerable extent without having observed any ill effect, was not inclined to associate the condition with the anthelmintic treatment, and thinking that the animal must have been abnormal in the first place, concluded that the *post-mortem* findings could not be regarded as evidence of phenothiazine intoxication—a conclusion similarly arrived at by Errington (*q.v.*) in 1941.

Second Example

Nothing further of this kind came to our notice until early in 1941 when a veterinary practitioner reported a fatal result in two two-year-old colts, each of which had received a 30-gramme dose of phenothiazine. Superpurgation developed in these two animals, one of them dying on the fourth day following the administration of the dose, and the other on the seventh day; in each instance the superpurgation showed a tendency to check after continuing for some 24 hours, but extreme weakness remained, both animals being unable to rise.

Third Example

The third report reached us in June, 1941, and concerned three thoroughbreds between three and four years old; two at grass and one in the stable (on account of a leg injury). Doses of 35 grammes of phenothiazine administered in a bran mash were followed by marked toxic symptoms. One animal (at grass) exhibited pain, depression and constipation and the dark red urine which was passed was found, on laboratory examination, to contain haemoglobin. This animal was very ill indeed when seen by the veterinary practitioner on the third day after treatment. The horse in the stable was less severely affected, and the other horse out at grass, the companion of the severely affected one, showed no symptoms. None of these animals died.

Fourth Example

(*a*) A seven-year-old Shire in moderate condition received 28 grammes of phenothiazine in a bran mash, and within six hours became so weak as to be unable to rise. On the following morning it was found dead, but no *post-mortem* examination was made. This is the most acute case so far observed.

(*b*) A six-year-old Shire belonging to the same owner, received 35 grammes of phenothiazine in the form of a liquid suspension in a gallon of warm water, administered by stomach tube. Four hours later this animal had become so weak as to be unable to rise after lying down; it was placed in the slings on the following morning and although it began to feed and showed some signs of recovery, it died eight days later. No diarrhoea was observed in this instance nor were there any signs of icterus in the mucous membranes. A *post-mortem* examination was not made.

Fifth Example

Each of six young Shire horses received 35 grammes of phenothiazine. One of their number, a two-year-old filly, afterwards showed signs of intoxication. On the second day this animal was listless and refused to eat, became progressively weaker and died on the third day. *Post-mortem* examination again revealed the greatly enlarged kidneys which were reported to be of a spongy texture, and the bladder full of dark red urine: no other abnormalities were reported.

Summary and Conclusions

The extensive use of phenothiazine among horses has revealed the exceptional occurrence of a sensitivity to the drug and, in a few instances, a fatal intoxication has resulted from the administration of an ordinary anthelmintic dose. No close relationship has become apparent between the condition, age or weight of the horse, and its susceptibility to intoxication and, as yet, we do not know how it may be avoided. Nor do we know of any effective antidote when toxic symptoms have once appeared. Some ameliorating effect has resulted from blood transfusions, but other attempts, including the administration of purgatives and the intravenous injection of calcium gluconate and methylene blue, have shown no effect whatever.

The symptoms, which may appear within six hours of the administration of the dose, or may be delayed for two or three days, are of restlessness or dullness, a quick, weak pulse, colicky pains, diarrhoea or constipation, jaundice, anaemia and great muscular weakness which, if death is delayed, may last for several days. The temperature usually remains about normal although in the later stages it may rise to 103° or 104° F.

Post-mortem examination frequently reveals the presence of a greatly enlarged heart, liver and kidneys which, however, usually appear to the naked eye to be normal in other ways. There are also signs of icterus, and the bladder may be filled with darkly coloured urine.

The destruction of red blood corpuscles and the production of anaemia as evinced by the lowering of the erythrocyte count and the passage of haemoglobin in the urine, appears to be one of the most marked of the toxic effects of phenothiazine, so that blood transfusion is the obvious symptomatic treatment. The amount of blood that can be given, however, appears to be inadequate in many instances for the tiding of the animal over the danger period, and death supervenes before the excretion of the drug is far enough advanced for recovery to take place.

The reason for the occasional susceptibility remains a complete mystery but it is not improbable that dietary factors have some bearing, the very similar association between the carbon-tetrachloride poisoning and rich pasture, or a supplementary ration of concentrated food, being tolerably well established. As yet, however, no such connection has been noted in the case of phenothiazine and it is too early even to guess at the sensitising agents. There is every reason to hope, however, that further research will reveal some way by which treatment may be rendered safe for routine use in the prevention as well as in the cure of redworm disease.

It may be a highly significant point for the better understanding of anthelmintic action that our two best anthelmintics, phenothiazine and carbon tetrachloride, with safety factors ranging from 1 : 10 to 1 : 50, should occasionally produce fatal intoxications in the ordinary anthelmintic doses, and it seems not improbable that there is some essential connection between anthelmintic action and occasional marked sensitivity of the host to these drugs. Since we have now two widely dissimilar chemicals both showing these two characteristics to a marked degree it may not be expressing too sanguine a hope to suggest that before long we may be able to take a step towards a common solution to the two mysteries of anthelmintic action and of anthelmintic intoxication.

Recommendations

When grouped together, as they are in the preceding paper, the reports of phenothiazine poisoning present what might be considered sufficient evidence to disparage the value of the drug for use in horses, if not to condemn it altogether. Further consideration, however, shows the fallacy of such a view, numerous veterinary practitioners having used it as a routine treatment without mishap and over a thousand horses having been treated by the R.A.V.C. alone, without any untoward effect. It is obvious, therefore, that the actual incidence of phenothiazine sensitivity must be very low, and that there can be no reason for any drastic curtailment in the use of this drug for the treatment of existing cases of strongylosis; nor is there any reason to discontinue its use as a preventive measure among horses that are known to be safe subjects. It is evident, however, that caution must be exercised in treating anaemic animals and that wherever preventive treatment is contemplated among a number of horses a small representative proportion should receive a trial dose first, in order to eliminate the possibility of an existing group-sensitivity and minimise the more serious risk undertaken in treating a number of horses at one time.

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REPORT

[ALAN, DUKE OF NORTHUMBERLAND MEMORIAL FUND: 8th REPORT OF THE MANAGEMENT COMMITTEE.]

The report for 1942 is drawn on lines similar to those of preceding reports. It draws attention to the concessions available to subscribers in being able to purchase through the Fund certain biological and other products at reduced prices and indicates the way in which these products may be used for the treatment and control of certain sheep diseases.

Research articles set out work which has been done on the control of sheep ticks, on parasitic diseases in lambs and cattle and on hill sheep border pining. Work on grass disease in horses is also mentioned and it would appear that a trial on a considerable scale of the influence on the incidence of the disease resulting from the feeding of "a small amount of a special supplementary mixture in the food" is being conducted. It is claimed that the horses fed on this supplement "are showing improved condition, and appear to be responding to the treatment." The nature of the supplement being fed is not disclosed and it is not clear whether the response to treatment is a lowered incidence of grass sickness in the experimental horses.

The list of subscriptions to the Fund for 1941 again shows a material increase on that of previous years.

CLINICAL COMMUNICATION

A Further Case of Fits due apparently to Dietary Deficiency in Young Pigs

J. PICKUP, M.R.C.V.S.,

Barnet

About two and a half years ago I reported a case in which a group of young pigs developed fits but recovered when their diet was changed from one brand of commercial pig food to another (Pickup, 1939). As indicated in that communication, as well as in an annotation appearing in the same issue of *The Veterinary Record*, the clinical condition of the animals bore a close resemblance to that described by Chick and her co-workers in pigs deficient in "eluate factor" (vitamin B_6) of the vitamin B_2 complex. In the absence of any ready facilities for biological assay of the suspected pig food, it was not possible to determine whether it was, in fact, deficient in any of the B vitamins. Although vitamin B_6 deficiency has since been shown—in studies involving the use of the pure vitamin—to be associated with epileptiform fits in another species (Chick, El-Sadr and Worden, 1940), it is not the only possible non-infectious cause of such seizures in young pigs. One of the workers at the National Institute for Research in Dairying pointed out to me, in a private communication, that vitamin A deficiency might have been considered as a possible cause of the symptoms observed, while similar fits in young pigs have been ascribed to calcium-deficiency and have been described as prerachitic symptoms (Carlström and Svanberg, 1931, 1932). The occurrence of convulsions as prerachitic symptoms in pigs was noted also by Hutyra and Marek (see 1913 English edition, p. 942). The relationship between infantile tetany and rickets has, of course, long been recognised in human medicine (see Cantarow, 1931, pp. 143 *et seq.*).

Recently a further case of fits in young pigs occurred within my practice. The subjects were the ten members of a Large White-Middle White crossbred litter, farrowed indoors (concrete floors, straw bedding) towards the end of October, 1941. The maternal diet consisted mainly of "swill," together with an allowance of meal, and when the piglets reached four weeks of age it was supplemented by middlings (weatings) and facilities were provided for them to "creep-feed" from the same mixture. Some scouring occurred during the last few days of the suckling period. At eight weeks of age the young pigs were weaned, and were provided with a diet consisting of middlings only. Within five days, several of them commenced to have seizures at feeding time. The symptoms were similar to (although less severe than) those previously described (Pickup, 1939) in that the animals fell to the ground in convulsions as they approached the trough. In a few cases the pig would actually put its nose into the food before falling. The convulsions were of short duration, and in most instances terminated by the animal's going "stiff as a board." Similar attacks occurred in all members of the litter at one feeding time or another, although in some they were more frequent and severe than in others. One animal died after two days, but there were no macroscopic findings of significance on *post-mortem* examination.

Changes in diet and management were advised. The animals were given a diet consisting of equal parts of bran and weatings, together with fairly liberal quantities of reconstituted dried milk and supplemented by yeast, chalk and common salt; the owner subsequently added whole boiled potatoes to this mixture. A few days later limited access was allowed to open air and to a patch of earth covered with cinders. (The owner was a small pig-farmer only, and was unable to allow his animals access to the open except when there to supervise them. Grassed land was not available.)

The response was excellent. Eight animals (including the "ritling") made rapid returns to normal health and appetite, and further fits were not observed in them. The ninth animal, which had been very severely affected, began also to eat and likewise ceased to have fits; it progressed more slowly than the others, however, and retained evidence of its affliction in the shape of a deformed back, there being a small but marked depression over the lumbar region.

General advice was given about subsequent care and management, and in particular the owner was urged to try to feed a properly balanced ration, so far as war-time conditions allowed,

and to allow his young stock as much access as possible to fresh air and to earth. The importance of mineral supplements was stressed.

I am grateful to Messrs. W. R. Muir (R.V.C.) and Alastair N. Worden (Cambridge) for the interest they have shown in this case.

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ABSTRACTS

[INFECTION OF ADULT CATTLE WITH *MYCOBACTERIUM TUBERCULOSIS AVIUM*. Glover, R. E. (1941.) *J. Hyg. Camb.* **41.** 290-296.]

Thirty-five unselected cattle which had been previously tested simultaneously with synthetic medium johnin and bovine tuberculin were examined *post-mortem* for the presence of avian tuberculosis by submitting glandular material and suitably treated portions of small and large intestine therefrom to biological or cultural examination, details of which are given.

Fully virulent strains of *Mycobacterium tuberculosis avium* were isolated from five (14·3 per cent.) of these animals. Dual infections with bovine and avian types were demonstrated in two. Both animals had given *positive* reactions to both tests and although some glands showed tuberculous lesions the glands removed appeared normal. No macroscopic evidence of tuberculosis whatsoever was seen in two others, neither of which gave any reaction to either test. The remaining animal which gave a positive reaction to johnin only showed slight lesions in two mesenteric glands.

Strong presumptive evidence of infection with *M. tuberculosis avium* was shown in another five (14·3 per cent.) of these animals. A strain of low virulence was isolated from the macroscopically normal glands of one animal which gave a *positive* reaction to both tests. It proved impossible to cultivate, beyond the first generation, a strain isolated culturally but not biologically from the intestinal mucous membrane of a second animal. This animal, a positive reactor to both tests, showed several old glandular lesions, stained smears of which showed the presence of acid-fast organisms. No acid-fast organisms were isolated biologically or culturally from the three remaining cases, two of which were negative to bovine tuberculin but positive (one slight) to johnin, while the third was positive to both. All three showed macroscopic lesions of varying degree in mesenteric glands shown on histological examination to be tuberculous in nature.

[The evidence submitted of the incidence of avian tuberculosis in cattle is of outstanding importance to those concerned with any official tuberculin testing policy and the need for greater research into the possibility of producing a specific type of tuberculin is likewise made obvious.—*Abstractor.*]

W. T. R.

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[BOVINE SURGERY. Fowler, G. R. (1941.) *J. Amer. vet. med. Ass.* **98.** 770. 393-399 (1 fig.).]

In a paper covering the common surgical interferences affecting the udder and teats the author stresses the need for strict asepsis and points out, as a warning to all bovine surgeons, that the teat is an appendage easily injured and, histologically, one that lends itself to the formation of excessive granulation tissue upon repair. It would appear that injuries and pathological conditions are little different from these as occurring in this country and remedial measures are much the same. In most cases operative interference is conducted with the animal in the recumbent position and anaesthesia consists of tissue infiltration above the site of operation aided in some cases of teat surgery by injection of the anaesthetic solution into its lumen.

Most serious teat derangements are in the nature of occlusion at some point of the milk channel and are invariably due to reproductive inflammatory reaction consequent upon injury. It is natural therefore that operative interference in the majority of cases aggravates the initial lesion. The result of this interference in most cases will depend upon whether or not the artificial channel produced can be kept open in the manner of a fistula whilst healing takes place. This can only be done by milking the affected teat at frequent intervals after the operation. It is on this account that most of these operations are performed, to give best results, when the cow is in full milk. A notable exception, of course, is the all-too-well-known teat fistula which occurs at the side of the teat as the result of wounding. It is suggested here that the treatment be deferred until the animal is dry.

The author is not very optimistic over the treatment of so-called tumours in the teat which in most cases are chronic inflammatory growths. "Pedunculated growths offer more hope than flat diffuse ones. Those in the middle of the teat are more promising than those near the udder or at the orifice. Those completely encircling the teat are the worst of all."

In connection with membranes across the base of the teat two types are mentioned. One, which is congenital, is first noticed in heifers at the onset of lactation. The quarter is full and firm but no milk can be withdrawn. This type of membrane is thin and easily broken down and prognosis is good.

The other type is more frequently seen in older cows. It is much thicker and is inflammatory in nature. In the author's view operative interference is unsatisfactory on account of the risk of setting up mastitis and also because closure of the teat canal invariably occurs again in the course of a few days.

C. F.

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[I.—FURTHER EXPERIMENTS ON THE FIELD VOLE WITH TUBERCLE BACILLI ; II.—FURTHER EXPERIMENTS ON THE GOLDEN HAMSTER (*CRICETUS AURATUS*) WITH TUBERCLE BACILLI AND THE VOLE STRAIN OF ACID-FAST BACILLUS (WELLS) ; III.—THE SURVIVAL OF THE CALMETTE-GUERIN STRAIN OF TUBERCLE BACILLUS (B C G) IN THE BLOOD AND MAMMA OF GOATS. Griffiths, A. S. (1941.) *J. Hyg.* **41.** 250, 260 and 266.]

I.—Typical bovine strains cause progressive lesions in voles with much caseation. Human strains whether dys- or eugonic are much less virulent for voles and do not cause caseation except occasionally in the nearest lymph glands. Strains from lupus and other attenuated strains behave as bovine strains in the vole. Seven strains from Nigeria were also examined and though typically human to other tests differed considerably in their pathogenicity to voles.

II.—Tubercle bacilli injected subcutaneously or per os are pathogenic to the golden hamster. Their virulence is in the order bovine>human>vole>avian. The human was practically as virulent as the bovine but the avian rarely caused macroscopic lesions.

III.—50·0 mgm. of B C G when injected intravenously killed a goat in nine days from pneumonia, the bacilli being demonstrable throughout in the blood. Four successive injections of 10 mgm. at roughly five monthly intervals did not cause death and the organism disappeared from the blood in 3-5 days. The bacteria did not disappear more rapidly after the last than after the first injection, and they were not found in the milk. Intramammary injections caused destruction of the gland, and though the organisms could be demonstrated microscopically they could not be recovered for longer than 15 weeks.

P. S. W.

IN PARLIAMENT

The following are among questions and answers recently recorded in the House of Commons:—

Infected Store Cattle (Disposal)

Mr. Price asked the Minister of Agriculture what steps will be taken, in view of the refusal in future to accept store cattle for slaughter, to ensure that store cattle reacting to the johnin blood test can be disposed of so as to prevent infection?

Mr. Hudson: I am at present in consultation with my right hon. Friend the Minister of Food on this and allied questions.

Food Consumption by Dogs

Mr. Purbrick asked the Parliamentary Secretary to the Ministry of Food whether, in view of the necessity for conserving all foodstuffs, any steps are being taken to reduce the dog population?

Major Lloyd George: The dog population has fallen considerably since the outbreak of war. The question of food consumption by dogs is being kept under constant review.

Agricultural Prices

Mr. Henderson Stewart asked the Secretary of State for Scotland whether he is aware of the anxiety felt by farmers and poultry-keepers on account of the delay in announcing higher prices as a result of the increased costs of production; and when this announcement may be expected?

Mr. Johnston: Following separate meetings with representatives of the English and Scottish National Farmers' Unions respectively, my right hon. Friend the Minister of Agriculture and I yesterday met representatives of the two Unions on the subject of agricultural prices. A final announcement will not be long delayed. [The announcement in question was made at the week-end.—*Editor.*]

Motor-Car Tyres (Licensing Scheme)

Flight-Lieutenant Etherton asked the Minister of Supply whether he can now indicate the conditions on which motor-car tyres will be available to the public when the present prohibition on purchases is lifted?

Sir A. Duncan: I hope to announce the scheme for licensing civilian tyres shortly. In the meantime, the standstill Order remains in operation.

EUROPEAN AGRICULTURE: SCIENTIFIC PROBLEMS IN POST-WAR RECONSTRUCTION

The British Association announces that a conference on the above, arranged by the Division for the Social and International Relations of Science, will be held on Friday and Saturday, March 13th and 14th, in the rooms of the Royal Society, Burlington House.

British and foreign experts will discuss the immediate technical steps necessary for reconstruction, settlement, marketing and prices, farm and factory, nutrition, the co-operative system, land reforms, peasant prosperity, excess population, peasant education, the improvement of peasant farming, livestock problems, artificial insemination, milk production, market gardening, and the relations of European agriculture to world conditions. A regional survey of European agriculture is contemplated, since it is felt that many of the problems of reconstruction may be better viewed regionally than within the limits of political divisions. Sir John Russell, F.R.S., will preside at the opening session.

Further particulars may be obtained from the secretary, British Association, Burlington House, London, W.1.

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An improvement in the health of dairy cattle, in particular fuller control of tuberculosis, contagious abortion and mastitis, as an essential adjunct of the urgently needed great increase in milk production, was urged by Sir John Russell, Director of Rothamsted Experimental Station and of the Imperial Bureau of Soil Science, in a recent address to the Royal Society of Arts.

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Weekly Wisdom

We have revised prices. Now revive endeavour.—"Farmer and Stockbreeder."

NOTES AND NEWS

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

Mar. 4th.—Annual Meeting of the Scottish Metropolitan Division, N.V.M.A., at Edinburgh, 2.30 p.m.
Mar. 5th.—Meeting of the Central Veterinary Society at the Conway Hall, Red Lion Square, W.C.1, at 2.30 p.m.
Mar. 7th.—Meeting of the Society of Women Veterinary Surgeons, at Liverpool, 2.30 p.m.
Apr. 1st.—R.C.V.S. Annual Fees due.
Apr. 16th.—R.C.V.S. Committee Meetings, Hotel Russell, London.
Apr. 17th.—R.C.V.S. Committee and Council Meetings, Hotel Russell, London.
May 11th.—R.C.V.S. Animal Management Examination begins.

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SOAP: APPLICATION FOR BUYING PERMIT

On enquiry, the Association has been officially informed that consumers requiring soap for other than personal or domestic purposes (*e.g.*, for manufacturing purposes, for use in connection with their business or profession, or for cleansing premises other than private residences and residential establishments) should make application on Form Soap (1) for a buying permit. The form can be obtained from the applicant's local Food Control Office and should be returned to that office after completion.

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PERSONAL

Birth.—On February 1st, 1942, at Royd House Nursing Home, Weeping Cross, Stafford, to Rosalind, wife of Ian Davison, M.R.C.V.S., Walton-on-the-Hill, Stafford—a son.

Forthcoming Marriage.—The engagement is announced between Mr. R. R. Bugg, M.R.C.V.S., of Aylesbury, son of Mr. and Mrs. R. L. Bugg, Kenton, Middlesex, and Miss Phyllis Wilkins, daughter of Mr. and Mrs. A. E. Wilkins, Calcutta, India.

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R.C.V.S. OBITUARY

Rees, John Forsyth, 22, Lammas Street, Carmarthen. Graduated London, April 11th, 1888. Died February 13th, 1942; aged 74 years.

A member of the United Counties' Agricultural Society and of the United Counties Hunters' Society, Mr. Rees had been a successful exhibitor of thoroughbred horses at the Agricultural Hall, Islington.

Watkins, Gerrard, "Almonte," Mareham-le-fen, Boston, Lincs. Graduated London, January 16th, 1896. Died February 16th, 1942; aged 67 years.

The Late Mr. Trevor F. Spencer, M.R.C.V.S.

A Further Tribute.

Mr. P. J. Howard, M.R.C.V.S., of Ennis, Co. Clare, to whose close friendship with Mr. Trevor Spencer reference was made in our account of the latter's career, sends the appreciation which follows:—

The veterinary profession is indeed poorer by the death of Trevor Spencer. An outstanding personality, he was born to be a veterinary surgeon and he was certainly an eminent and a successful one. His fine physique, his great and sound knowledge of agriculture, his love of animals and his genial disposition endeared him to a wide circle of friends. A keen judge of cattle and horses and a fine horseman, his opinion was sought and accepted with respect by an extensive clientele and by agriculturists and horse lovers at home and abroad.

Trevor Spencer loved his profession and as a member of Council his great ambition was the uplifting of the profession and the provision of greater facilities to ensure for graduates a more intimate practical knowledge of their work. He delighted in a good horse and a good hunt and we had many great days together. His ideal rest was with a fishing rod on a boat; his ideal holiday a trip to Ireland where he had many friends who loved him dearly. He loved his family and his home, which

was a truly happy one. His wife and family will miss him sadly. A grand fellow, a credit to his country and to his profession. As H. K. remarks, we have too few Trevor Spencers. May his spirit be happy in the realms beyond.

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GENERAL OBITUARY

Mr. Romer Williams

Many members of the profession will have heard with regret of the passing, at the age of 91, of Mr. Romer Williams, one who typified the popular conception of "a fine old British sportsman." Mr. Romer Williams was descended from an ancient Welsh family, and owned estates in Wales, but he migrated to Northamptonshire half a century ago to indulge his love of hunting over the famous pastures of the Pytchley and Grafton Hunts, of which he was the acknowledged "father." He also set up racing stables at Newnham Hall, with his own private gallops and trainer. He had owned over 50 winners, most of them being steeplechasers ridden by that noted jockey, W. Payne. In his younger years he was himself a noted rider. On one day at the Anglesey Hunt Races he rode three winners in one day on his own horses, and repeated the hat-trick at Towcester Races. His keen knowledge of horses made him probably the best-known judge in the kingdom, for he had been judge at most of the leading shows.

For many years Mr. Romer Williams was Chairman of Hurst Park Racecourse, of which he was a founder, and he was also a Past-President of the Hunters Improvement Society, Senior Steward and Vice-President of Richmond Royal Horse Show, and a Governor of the Royal Veterinary College from 1897-1904.

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VETERINARY AID TO RUSSIA

The R.S.P.C.A., through their War Animals (Allies) Fund, which is registered as a War Charity, are sending veterinary supplies for the horses and other animals belonging to the Soviet Army. The first request from the Soviet Government is for £40,000 worth of drugs, veterinary wallets, haversacks, dressings, field hospitals, and so forth. We understand that the Soviet Army has a very good veterinary service and that the services of British veterinary surgeons are not required at the moment: the one trouble is shortage of veterinary supplies.

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LEGAL NOTES

Failure to Slaughter "Uneconomic" Cattle.—The first prosecution under the war-time regulations providing for the slaughter of uneconomic cattle to ensure that feeding-stuffs go only to thrifty animals, was brought at Thingoe Petty Sessions, at Bury St. Edmunds, on February 11th. Robert Brown, Crossways Farm, Great Wilbraham, Cambs, pleaded not guilty to a summons that on November 21st he failed to comply with a direction made on October 23rd, under the Livestock Control Order, 1941, by the Minister of Agriculture, under the Defence Regulations directing him to dispose of for slaughter two cattle at Hall Farm, Higham. He was defended by Mr. S. T. Miller.

Reporting the proceedings, *The East Anglian Daily Times* says that Mr. A. E. Graves, from the Ministry of Agriculture, for the prosecution, said since the order on defendant was made in October it was estimated that these two cattle must have been supplied with two tons of feeding-stuffs, for which he understood no return was likely to come. Defendant's farm at Higham was inspected in October by the Dairy Panel of the West Suffolk War Agricultural Executive Committee, together with Mr. Willing, the Divisional Veterinary Inspector of the Ministry, and two cows, a Friesian and Guernsey, were found to be suffering from chronic mastitis of the udder. They were accordingly marked "C" on the shoulder, and the Committee made the order for their slaughter on October 23rd, but the cattle were still alive, although they were entirely uneconomic. If the udder was not in use for some months, through absence of milk, conditions improved, and many a farmer was led to believe that mastitis in cows was a quite unimportant complaint because it appeared to come and go, but it never really disappeared. If these cows were examined after "drying out" for some time, a veterinary surgeon would probably be quite prepared to say that they did not appear to be suffering from mastitis.

Evidence was given by Cecil F. Pattle, Chief Officer of the West Suffolk War Agricultural Executive Committee, Alfred G. Goodwin, District Officer, George Chrystal, a member of the War Agricultural Executive Committee, and Richard R. Willing, M.R.C.V.S., Divisional Veterinary Inspector of the Ministry, who said the Friesian cow in question had chronic mastitis of three quarters of the udder, and nothing would make it a useful, economic dairy cow. The Guernsey cow had chronic mastitis of the left hindquarter of the udder.

Defendant, in the box, said he bought the Friesian about June for £19 10s., and she was perfectly all right in the udder. They had not milked her out for three weeks when she was examined, and they were "drying her off." When dried off, 99 cows out of a 100 went thick in their milk. This cow's condition was very good.

"We have plenty of food on the farm," said defendant. "I have grown all the food to feed all the cows I wish to keep."

The Guernsey cow he bought for £14 10s. to fatten if she was empty or otherwise to calve down. She was perfectly all right in the udder. He complained that no reason was stated in the Order served on him why he was to dispose of these two cattle. He bought them as paying propositions because he got his living from the farm. The Guernsey would be worth £30 to £35 and if the Friesian came correctly in the udder, as he thought she would, she would be worth £40 to £45.

Mr. Graves: You still say they are not suffering from mastitis?—Yes. My expert evidence will prove that one cow is not suffering from mastitis.

Mr. E. A. Hudson, M.R.C.V.S., of Barrow, who made clinical examinations of the two cows on February 4th, said the Friesian was a good-looking animal in good condition. She had mastitis in two quarters of her udder. The Guernsey was in good health and condition, and making slight preparations for calving. She was sound in the udder.

In reply to a question, witness said that simply from a clinical examination he could not state definitely that the Guernsey was not suffering from mastitis, but he pointed out that the majority of cattle were sold by clinical examination in the open market.

Mr. Graves: Had you been able to carry your examination further you might have given entirely different evidence?—Yes.

Further answering Mr. Graves, witness said he entirely disagreed that these were cases of infectious mastitis.

The Bench, over which Sir John Tilley presided, convicted, and imposed a fine of £25. An application for costs was refused.

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A defence that a dog alleged to be harrying sheep was shot because the sheep were in peril, failed in Penrith County Court, and judgment for £10 was given.

Judge Allsebrook pointed out that the law on the subject was that if a dog was worrying or molesting sheep, it could be shot if there was no other way to stop it, but in cross-examination defendant admitted he did not make any gesture to the dog, such as pretending to throw a stone; he just shot it.

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A Derbyshire cattle remover has been heavily fined for conveying cattle in a truck not giving protection from the wind. It was stated that two cows were in the truck, which had no roof or suitable covering, on a day when it was bitterly cold, raining hard, and with a strong wind blowing.

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CLOSING OF SLAUGHTERHOUSES IN SCOTLAND

Fear that considerable inconvenience will be caused to farmers by the contemplated closing down of slaughterhouses is expressed by the N.F.U. of Scotland in a letter to the Ministry of Food. They point out that several of these buildings have already been closed and it is believed that it is only a matter of time before others will be closed down.

"It is known," states the letter, "that the Ministry intends to close down approximately half of the 'export slaughterhouses' in Scotland. Under existing legislation the producer is bound to deliver to the Ministry casualty animals, either alive or in carcase form. With the closing of slaughterhouses many producers will find themselves a considerable distance from a slaughterhouse. It is the opinion of our committee that the onus of providing means of handling casualties economically must be the responsibility of the Ministry."

MINISTRY OF AGRICULTURE NEWS SERVICE

Winter Food Supplies

Autumn weather conditions did not cause any exceptionally heavy calls on winter food supplies but it is a good plan to see how supplies stand at this time of the year.

How long winter feeding must continue depends on district and season but few farmers can count on much help from spring grass before the middle or end of April, even in a favourable spring. Top dressing some of the earlier and most sheltered grassland in February or early March with 1½ cwt. per acre sulphate of ammonia will bring the grass along a fortnight or so earlier than untreated fields and on most farms with livestock to provide for, some 10 per cent. of the pastureland could well be treated in this way.

It is much better to plan to economise in fodder for the full winter period and if there should be a little hay left over till next winter it will be useful with the reduced amount of permanent meadowland now remaining. If a silo of well-made silage can be left unopened that too will carry over till next winter or serve as a useful safeguard against shortage of keep in a summer drought.

But the main thing is to plan the feeding now so that roots, hay, straw and silage are fed at rates which can be kept up until there will be ample keep on the pastures, even in a late spring.

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Brewers Wet Grains

A Cheap Nourishing Feed without Coupons.—At present prices, wet grains are relatively cheap and they can be got without coupons. Their composition closely resembles that of young grass and they exert a similar stimulating effect upon the milk flow. They are more concentrated than grass, containing as they do more than half as much again of dry matter and protein.

In earlier days, before farmers came to rely so exclusively on imported feeding-stuffs, wet grains were a favoured food for all classes of stock, particularly dairy cows. One gets a very good idea of the important part they played in farm dietaries from the judge's reports on the R.A.S.E. Farm Competitions conducted in Derbyshire in 1881. About 1 bushel (40 lb.) daily was a common allowance for a dairy cow. Nowadays we think the safe limit is nearer 28 lb. However that may be, there can be no doubt that in wet grains all farmers within reasonable distance of a brewery have at their command a wholesome, nourishing feeding-stuff that should not be ignored.

It appears that no difficulty whatever was experienced in the old days, in preserving the grains fresh for periods of 6 to 9 months. The usual store was an earthen pit or a bricked-off corner of a barn. Salt was sometimes used as an aid to preservation, but many farmers seemed to obtain equally good results without it. The chief factors in success were pressure and the exclusion of air.

Wet grains are specially serviceable for farmers who have plenty of straw but are short of hay. They have only to adopt the simple equation:—

Straw plus Wet Grains = Hay.

Cattle wintering out do well on this combination. The straw is laid in little heaps. In the absence of the usual tubs, wet grains may be distributed on small sheets of corrugated iron—or even on old manure bags, if you have them. It is generally possible on a farm to improvise some means of keeping the grains off the bare ground.

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Rationing of Feeding Stuffs

County War Agricultural Committees have been asked to exercise the greatest economy in using cereal reserves at their disposal. The committees have received the following information:—

Mountain Ewes.—Maize is not available, but flock masters may obtain linseed cake and undecorticated cotton cake, in the proportion of two parts to one, against protein coupons overstamped "Hill Sheep." These will be issued only in cases of need. Advance issues of coupons may be made to isolated farms where access is impossible in bad weather.

Bonus Coupons.—The withdrawal of the option to apply for cereal instead of protein coupons against an undertaking to sell oats or dredge corn now applies to all further applications even if an undertaking was given before November 15th, 1941.

Pig and Poultry Keepers.—(*a*) Sub-divided Holdings: When holding have been, or are in future sub-divided, the basic numbers of pigs and poultry will be allocated according to the respective acreages. For example, a holding of 100 acres returning in June 1939, 600 head of poultry, and having since that date been reduced, by sub-letting 90 acres, would have its basic number lowered to 60, the balance of 540 being allotted to the 90 acres. Rations may, however, be based on actual numbers on December 4th, 1940, on a part of the holding if the Committee is satisfied, from the evidence produced (which must include production of a tenancy agreement) that the land comprising that part was in fact a separate holding at that date, and that the poultry or pigs on which the occupier claims to be rationed were all kept then on that part.

(*b*) Exchange of Protein for Cereal Coupons: When satisfied that more protein is needed to balance waste material Committees may issue one protein coupon for each two cereal coupons surrendered, provided the latter do not exceed one quarter of the farmer's total basic pig and poultry issue. A reverse exchange may also be considered. Coupons available for exchange by individual Committees are subject to an overriding limit each month.

Avoid Waste in Farm Storage.—Neither a human being nor a sack of feeding stuffs derives any benefit from sitting on a damp floor. Be careful, therefore, how you store food for your livestock. A concrete floor draws the damp and it is advisable to put down some kind of wooden platform before using for storage. Keep sacks well apart. Avoid as much as possible the piling of one lot on the top of another. Place fresh consignments beside the old, not on top, and use the old before commencing the new.

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Good Coupon Value

Dried Sugar Beet Pulp for Dairy Cows.—Crushed oats stand at present at £15 15s. 0d. a ton, a price that will rise. Dried sugar beet pulp sells at less than £6 per ton. In rations for dairy cows, other cattle, and sheep, the pulp may be used on a pound for pound basis.

More dried pulp has been produced than was anticipated and an additional quantity is to be released for distribution against cereal coupons. The quantity is, however, limited, and farmers who wish to purchase dried pulp against their cereal coupons should place orders with their merchants without delay.

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Carrots for Livestock

Special prices are announced for carrots used in livestock feeding. The carrots will be coloured with a vegetable dye so as to distinguish them from supplies sold for human consumption and they can be ordered from an agricultural merchant or any of the offices of the National Vegetable Marketing Co., Ltd.

Orders must be for a minimum quantity of five tons and in England and Wales lots of loose carrots are priced at £2 10s. 0d. delivered to the nearest railway station. This price may be raised during the season. In Scotland the official price has been fixed at £3 per ton delivered loose. Additional charges will be made for the use of bags.

Carrots give a better colour to winter milk and raise its vitamin A content. Dairy cows can be given up to 40 lb. sliced carrots per head per day. In the case of pigs, up to one-fifth of the total ration may be replaced by carrots, which should be grated or shredded when mixed with the meal ration and not cooked or steamed. Fattening bullocks should be given up to 60 lb. sliced carrots per head per day. For horses, 20 lb. per head per day is sufficient and the carrots should be washed and sliced.

Growers directed to send supplies for livestock feeding will be paid 1s. per ton for dyeing the carrots. Sound and marketable carrots will be paid for at the guaranteed prices already announced.

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Pest Control

Approved List of Proprietary Products.—In war-time the control of insect pests and plant diseases is of special importance. A scheme for early adoption is under consideration by the Ministry of Agriculture whereby proprietary makes

of insecticides and fungicides could be put on an approved list under their brand names.

Many products now in common use contain such well known bases as lead arsenate, lime sulphur, and 'straight' tar-oil washes, and their manufacture is in accordance with specifications agreed by the Ministry of Agriculture. The makers of such products will be eligible, upon application, for inclusion on the list.

Insecticides and fungicides for which no agreed specification exists will be included, provided the manufacturers are willing to disclose certain particulars relating to their products and are able to substantiate their performance in the field. It is believed that the necessary particulars could be provided without disclosing any information that for trade purposes they would wish to regard as confidential.

The Association of British Insecticides Manufacturers have already outlined the scheme to many manufacturers but any others who are interested can obtain a copy from the Ministry of Agriculture, Lindum Hotel, St. Annes, Lancs.

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H.M. STATIONERY OFFICE PUBLICATIONS

The undermentioned have been published recently. Copies can be purchased through any bookseller, or directly from H.M. Stationery Office.

	Price net s. d.	*Post free* s. d.
Statutory Rules and Orders:		
143. Diseases of Animals. Brucellosis Melitensis (Amendment) Order, January 16th	0 1	0 2
Agriculture and Fisheries, Ministry of:		
Leaflet, Advisory, 32. Joint-Ill in Young Lambs. Each	0 1	0 2
Dozen	0 9	0 11
Scientific and Industrial Research, Department of:		
Food Investigation Board. Index to the Literature of Food Investigation, Vol. 13, No. 2. September, 1941. (47-71-33) ...	4 6	4 8

CORRESPONDENCE

Letters to the Editor should reach the Office not later than by the first post on Monday morning for insertion in following Saturday's issue. *The views expressed in letters addressed to the Editor represent the personal view of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.*

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"TO WHOM HONOUR IS DUE"

To the Editor of the Veterinary Record

Sir,—The Prime Minister's noted saying that "We owe so much to so few" is applicable to our profession and those few are the gentlemen who have done all the work in connection with sterility, abortion and mastitis and have stimulated the interest of the general practitioner and the public therein.

There is not a practice in the country which has not benefited by those "few," and for Dr. Hare to take the attitude which he did at the Council meeting on December 30th was to my mind unjust.

The cost should not be considered: what is £800 or £900 divided amongst all the general practitioners in the country, not to mention the advancement which the profession is receiving in the eyes of the farmer and so helping the nation when such aid is most needed? There was never a time when the saving of livestock was so important as it is now and the stock-owners expect it from us no matter what the cost may be. Very few farmers now grumble at their accounts, but they want "service" not "self," and whatever money is spent on advancement is spent in the interests of the country. So I would say, "Carry on you 'few' and do not consider the expense so long as you obtain the results."

I propose that we request the R.C.V.S. to confer its fellowship upon Messrs. Steele-Bodger, Hignett and Gould, Professors Dalling and Miller, and Dr. Wooldridge, as a slight acknowledgment of our thanks and appreciation for all the work which they have done for the profession and give it them *now* when such recognition will be of some use to them and not when they are retiring and perhaps would not appreciate it as much.

Will other Fellows kindly support me in this suggestion, because these men are worthy of such an honour as I propose.

Yours faithfully,
G. C. Lancaster, F.R.C.V.S.

Eastwick House,
Evesham, Worcs.
February 12th, 1942.

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MILK FEVER AND ALLIED DISEASES

To the Editor of the Veterinary Record

Sir,—May I suggest to Mr. Hynes that in these cases of "ante-partum paralysis" prevention might be attempted.

I suggest two methods:—

1. Blood fibrinogen;
2. Special feeding bone meal.

To be added to any ration available.

Yours faithfully,
J. W. Hall Masheter.

Ruddle House,
Newnham-on-Severn,
Gloucestershire.

February 22nd, 1942.

[By a coincidence, an advertisement relating to these products is due for re-insertion this week, and will be found on page vii.—*Editor.*]

DISEASES OF ANIMALS ACTS, 1894 to 1937, and AGRICULTURE ACT, 1937 (PART IV).

Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

Period.	Anthrax.		Foot-and-Mouth Disease.		Parasitic§ Mange.		Sheep Scab.	Swine Fever.	
	Outbreaks confirmed.	Animals attacked.	Outbreaks confirmed.	Animals slaughtered as diseased or exposed to infection.	Outbreaks reported by the Local Authorities.	Animals attacked.	Outbreaks confirmed.	Outbreaks confirmed.	Swine slaughtered.
	No.	No.	No.	No.	No.	No.	No.	No.	No.
Period 1st to 15th January, 1942	12	12	—	—	2	5	31	14	1
Corresponding period in 1941	25	26	22	1,707	—	—	22	140	43
1940	21	22	4	558	4	6	23	190	107
1939	37	39	111	1,896	1	1	22	42	27

Note.—The figures for the current year are approximate only. §Excluding outbreaks in Army Horses.